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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : NITZAN, Boaz et al.
Serial No. : 09/822,500
Filed : April 2, 2001
For : OFFSET PRINTING PLATE FOR DIRECT INKJET CTP

Group Art Unit 1751
Examiner: G. Webb

Tel Aviv, Israel
February 23, 2003

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

DECLARATION UNDER 37 CFR SEC 1.132

I, the undersigned, Dr. Boaz Nitzan of Sde-Varburg, Israel, hereby declare as follows:

1. I am a co-inventor in the subject application.
2. My educational qualifications are summarized as follows: B.Sc. in Pharmaceutical Chemistry, Bar-Ilan University, Ramat Gan, Israel, 1992; M. Sc. in Chemistry, Bar-Ilan University, Ramat Gan, Israel, 1994; Ph.D. in Chemistry, Bar-Ilan University, Ramat Gan, Israel, 1999.
3. I am currently employed as Substrate Group manager at Aprion Digital Ltd. 5c Hatzoran St., Poleg Industrial Zone, Netanya, Israel 42505. Aprion designs, develops, manufactures and markets cutting-edge digital printing presses and specialized water based inks for industrial applications based on Aprion Digital's patented MAGIC (Multiple Array Graphic Inkjet Color) drop-on-demand piezo inkjet technology.
4. A list of my recent publications is attached to the end of this affidavit.
5. The subject patent application deals with a pre-treatment liquid used to treat an anodized aluminum plate that interacts immediately, both chemically and physically, with the CTP liquid to form a stable image with no clustering phenomenon. In this way, the image quality on the plate and the speed of plate preparation can be improved.

6. The pre-treatment liquid of the subject application comprises an ion donor and a polymer swelling reagent and/or a coalescence reagent. The liquid can be provided as an aqueous and/or alcoholic solution or an oil in water emulsion (where the oil is a non-miscible swelling reagent). The pre-treatment liquid is applied to form a thin homogeneous layer of approximately 4 μm to the entire upper surface of the recording plate. The swelling reagent and/or coalescence reagent as well as the ion donor are physically well localized in the porous structure of the plate's surface. After partial drying of the pretreated anodized aluminum plate, CTP liquid is deposited onto the surface to form an image. The CTP liquid solids react with the pre-treatment liquid and are, therefore, chemically bound to the surface. This allows all data to be deposited in a single pass of the inkjet head without the problem of clustering. The solids in the CTP liquid precipitate in response to the localized ions deposited in the pre-treatment, and form interactions above and in the pores of the surface of the plate to give a mechanically stable ink dot.

7. The ion donor may be present as either an inorganic acid or a polyvalent metallic salt. The polyvalent metallic ions include anions and cations. A metallic salt comprised of the metallic ions Zn^{+2} or Ca^{+2} provides especially favorable results in terms of image mechanical stability. Preferable polyvalent metal salt anions are chloride or acetate for optimal thermal stability. The pH of this acidic pre-treatment solution can vary between 1-4.

8. The swelling and/or coalescence reagent enables the creation of a stable dot shape with good film properties and with very good adhesion to the anodized aluminum surface. These good film properties promote the mechanical stability of the dot and consequently of the image.

Reply to the Examiner's rejection statements

9. The Examiner has stated that Kukharskay anticipates the claims 6, 7, 9-18 and 23 since he teaches liquid compositions containing glycol ethers, hydrochloric acid, ferric chloride, copper chloride and water. However, Kukharskay includes in his composition tetraethoxy-silane a substance which coats the glass causing hydrophobization of the surface. This is in direct contradiction with the needs of the present invention for even application of the pretreatment liquid and the CTP liquid.

10. Additionally, the acid in Kukharskay's preparation is used to prevent the Tetraethoxy-silane from undergoing rapid hydrolysis. The acid does not function as an ion donor. The purpose of the acetone or diethylene glycol diethyl ether is to dissolve the tetraethoxy-silane as it does not dissolve well in aqueous solution. It cannot act as a coalescence reagent or swelling reagent as there is no polymer present to form a film. Therefore, Kukharskay does not teach the use of an ion donor and a swelling reagent or coalescence reagent.

12. The Examiner has stated that Figov anticipates the claims 6, 7, 9-12, 19, 20, 22 and 23 since he teaches a composition containing phosphoric acid, diethylene glycol,

ethyl lactate and water, and a composition containing phosphoric acid, diethylene glycol diethylene glycol monobutyl ether, isopropanol and water. However, Figov lists in his first claim the use of a desensitizing agent which may include gum Arabic, mesquite gum, sodium carboxymethyl cellulose; oxalic acid and oxalate salts, all of which will interfere with the reaction of the present invention by forming a layer which will prevent the pretreatment liquid of the present invention and the ink from gripping the pores of the aluminum.

13. Additionally, the use of an inorganic acid does not necessarily constitute an ion donor, as required by the present invention. Figov's inorganic acid is acting as a desensitizing agent for promoting water-receptivity, (as seen on page 1 lines 45-55 and page 2 lines 86-90, and others.). This can not fit into the description of an inorganic acid as an ion donor. Therefore, Figov does not teach the used of an ion donor

14. Figov's use of diethylene glycol and diethylene glycol monobutyl ether is as a humectant and not for purposes of coalescence or swelling, but rather as a high boiling point component to keep the solution from drying too quickly. Therefore, Figov does not teach the use of a coalescence or swelling reagent.

15. The Examiner has stated that Matsumoto anticipates claims 6-24 since he teaches a composition containing nickel nitrate, phosphoric acid, dipropylene glycol monomethyl ether and water, and a solution containing magnesium nitrate, phosphoric acid, methoxypropanol and water. However, despite the fact that Matsumoto includes an inorganic acid in his composition, he does not have the ion donor required by the present invention. Inorganic acids may function as pH buffers or as ion donors. A pH buffer contributes to favorable conditions for performing a reaction while remaining neutral to the reaction. A pH buffer is not a reactant. On the other hand, an ion donor is physically active in the reaction. It is a reactant, and therefore, the reaction cannot take place without it. In the present invention, the ion is necessary for the reaction, i.e. it is a reactant. Thus, our claim recites an ion donor, and an inorganic acid is only a subset of ion donor. We must have an inorganic acid which is acting as an ion donor. Matsumoto clearly states in column 4 line 40 that the purpose of the inorganic acid in is for "adjusting or buffering pH of the dampening water composition and suitably etching or anti-corroding the support of the lithographic plate..." Matsumoto does not use the inorganic acid as a reactant and certainly not as an ion donor. Therefore, Matsumoto does not teach the use of an ion donor.

16. Additionally, Matsumoto claims in claim 8 the use of a polymeric polymer selected from a group composed entirely of substances which create a layer on the surface of the plate. This layer destroys the capability of the ink to grip the surface. This change in surface topography is extremely undesirable in the present invention.

17. The Examiner has stated that Gautier anticipates the claims 6-12 and 22-24, since he teaches a microemulsion composition containing phosphoric acid, water, ethylhexanol and surfactant, and a composition containing phosphoric acid, ethylene glycol monobutyl ether and water. A microemulsion is not compatible with the present invention as it dries

leaving a patchwork of hydrophobic and hydrophilic areas, creating a heterogeneous surface. The present invention requires a uniform, homogeneous surface.

18. Additionally, Gautier's inorganic acid is acting as an ion acceptor here – the opposite of the ion donor that the present invention requires. Gautier clearly states in Col. 3, line 22 that the acid may have an oxidizing activity, meaning it would function as an ion acceptor or be inert. (Please see paragraph 14 for more discussion of inorganic acids.) The ion donor of the present invention plays an active role as a reactant. Therefore, Gautier does not teach the use of an ion donor.

19. The Examiner has incorrectly brought 2-ethylhexanol from Gautier's Ex. 2 as reading on the coalescence or swelling reagent of the present invention. 2-ethylhexanol is an alcohol and could not act as a coalescence or swelling reagent. The purpose of this chemical is to act as a co-surfactant and lower surface tension (see examples 1 and 2).

20. The Examiner has stated that Herdt has anticipated the claims 6, 7, 9-12 and 22-24, since he teaches an antimicrobial acid cleaner for use on organic or food soil containing phosphoric acid and either ether solvent or glycol ether. Ether solvent could not be a component of the present invention as it cannot act as either a swelling reagent or a coalescence reagent.

21. Additionally, the phosphoric acid in the Herdt disclosure is clearly an oxidizer and not an ion donor. As an oxidizer, phosphoric acid acts as an ion acceptor. Therefore, Herdt does not teach the use of an ion donor.

22. The Examiner has stated that Beggs has anticipated the claims 6, 7, 9-12, 19 and 22, since he teaches a shear thinnable organic composition thickened with alumina containing water nitric acid, propylene glycol t-butyl ether and N-methyl-2-pyrrolidone. However, the pretreatment liquid of the present invention must be low viscosity. The thickening agent is counter-indicated by the liquid of the present invention.

23. Additionally, Beggs uses nitric acid in his preparation. The use of nitric acid is strictly prohibited with aluminum plates as the NO_3 reacts with the aluminum and changes its color.

24. All of the claim rejections refer to prior art references which do not relate to the field of preparing printing blanks for offset printing plate applications using direct inkjet CTP. The prior art references do not provide a composition which could be used for pre-treating a printing blank, either due to other components contained therein, or due to the functions that the individual chemical components perform based on the chemical environment provided by the preparations of the cited prior art references. Thus, none of these references provides a composition formed by an ion donor and a swelling or coalescence reagent for use in preparation of a pre treated recording medium for use in offset printing plate applications using direct inkjet CTP, as provided by the present invention.

25. I declare that all statements made herein of my own knowledge are true, and that all statements made on information and knowledge are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Sec. 1001 of Title 18 of the United States Code, and the willful false statements may jeopardize the validity of the application and any patent issuing thereon.

Signed this 23 day of February, 2003.



Dr. Boaz Nizan

Publications

1. Dolitzky, Y.; Sturchak, S.; Nitzan, B.; Sela, B.; Margel, S. "Synthesis, Characterization and Use of Immobilized Polyacrolein Microspheres: a model determination of α_1 -Antitrypsin in Human Serum". in *Analytical Biochemistry*, 220, 257-67, 1994.
2. Nitzan, B.; Margel, S. "Surface Modification II Functionalization of Solid Surface with Vinyllic Monomers" in *J. of Polymer Science: part A: Polymer Chem.*, 1997, 35, 171-181
3. Bamnolker, H.; Nitzan, B.; Gura, S.; Margel, S. "New Solid and Hollow, Magnetic and Non-Magnetic, Organic-Inorganic Monodispersed Hybrid Microspheres: Synthesis and Characterization" in *J. of Materials Science Letters* 1997, 16, 1412-1415.
4. Margel, S.; Bamnolker, H.; Gura, S.; Nitzan, B.; Tennenbaum, T.; Bar-Toov, B.; Hinz, M.; Seliger, H. "New Solid and Hollow, Magnetic and Non-Magnetic, Organic-Inorganic Monodispersed Hybrid Microspheres: Synthesis and Characterization". in "Scientific and Clinical Applications of Magnetic Carriers" Ed. Häfeli et al. Plenum Press, New York, 1997.
5. Margel, S.; Burdigin, I.; Nitzan, B. et al. "Functional Nanospheres : Synthesis and Biological Applications" in "Recent Research Developments in Polymer Science" Ed. S.G. Patilalai, Transworld Research Network. Vol.1, 1997.
6. Margel, S.; Gura, S.; Burdigin, I.; Nitzan, B. et al. "Ferrite-Coated Nanospheres for Biomedical Use". Proc. 4th IUMRS International Conference in Asia, Chiba, Japan. 1997.
7. Kotler, Z.; Sfez, B.; Margel, S.; Nitzan, B. "Lasing Without Cavity" SPIE Proc. series (Israel 10th meeting on Optical Engineering) Vol. 3110, 1997.
8. Prozorov, T.; Kataby, G.; Prozorov, R.; Nitzan, B.; Gedanken, A. "The Role of The Surfactant Concentration in Determining The Morphology of The Self-Assembled Coated Particle" *Thin Solid Films*, 1998.
9. Margel, S.; Sturchak, S.; Nitzan, B. et al. "Functionalized Microspheres: Synthesis & Biological applications" in "Microspheres, Microcapsules & Liposomes" Arshady, R. (Ed.), Plenum Pub. Co., 1998.
10. Margel, S.; Burdigin, I.; Nitzan, B. et al. "Ferrite-Coated Nanoparticle: Synthesis and Biological Applications" in *J. of the Magnetic Soc. of Japan* 1998, 22 (S1), 429.
11. Seliger, H.; Hintz, M.; Nitzan, B.; Gura, S.; Margel, S. "Solid -Supported Oligonucleotide Systems for Special Biomedical Applications" in *Nucleosides & Nucleotides*, in press, 1999.

12. Seliger, H.; Hintz, M.; Nitzan, B.; Gura, S.; Margel, S. "Polymer Supported Nucleic Acid Fragments – Tools for Biotechnology and Biomedical Research" in *Reactive & Functional Polymers*, in press.

13. Hinz, M.; Gura, S.; Nitzan, B.; Margel, S.; Seliger, H. "Polymer Support for Exonucleolytic Sequencing" in *Journal of Biotechnology*, 2001, 86, 281-288.